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CP

Dual

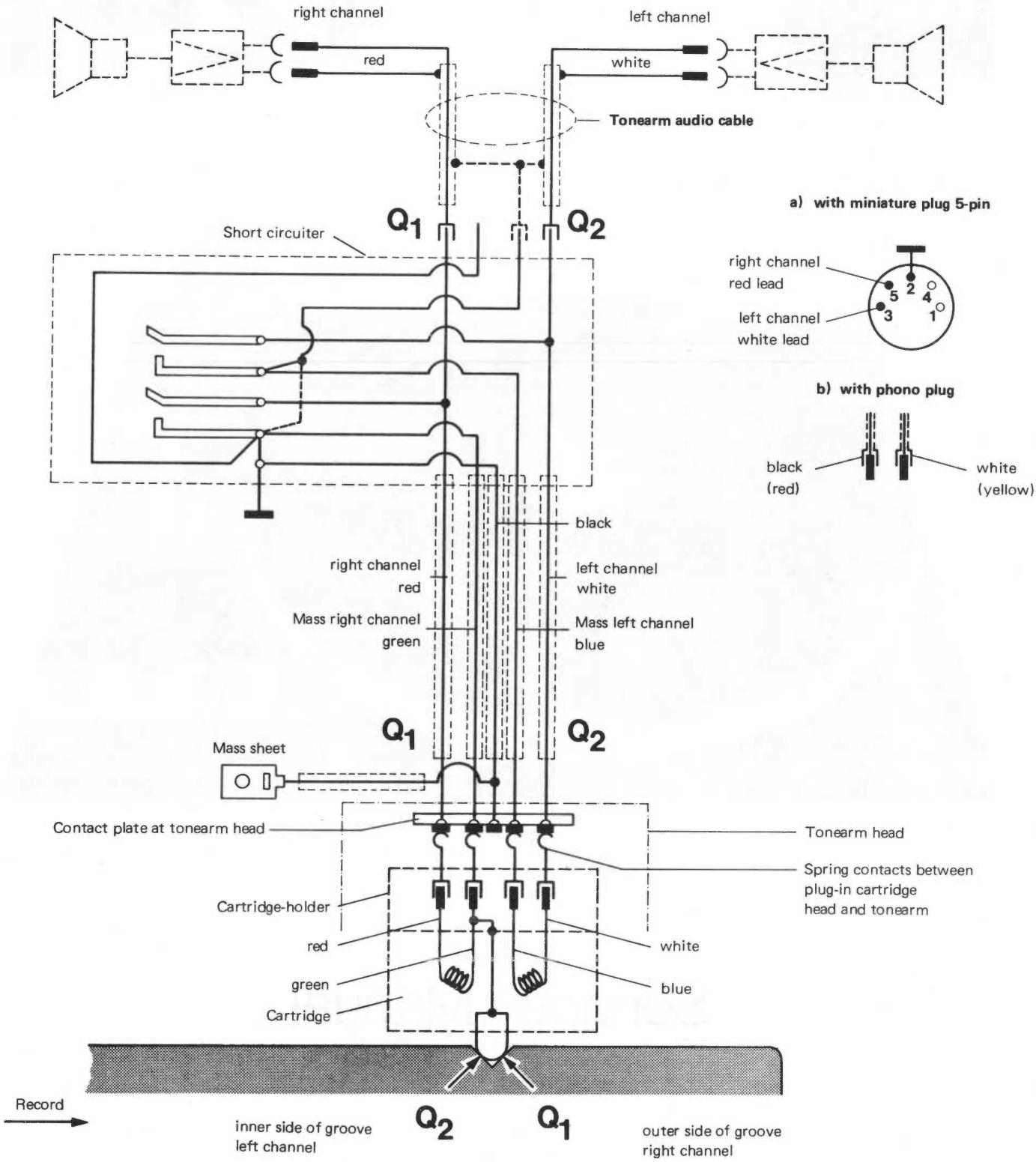
1241

Edition February 1978

Service - Manual

Dual Gebrüder Steidinger · 7742 St. Georgen/Schwarzwald

Fig. 1 Pick-up Connection Diagram



Contents

Page	
2	Pick-up Connection Diagram
3	Technical Data
4	Motor and Drive
4	Speed changeover
4	Platter
4	Flat Belt
4	Changing of Drive Pulley
4	Adjustment of nominal speed
5	Tonearm and Tonearm Bearing
5	Removal of Tonearm from the Bearing Frame
5	Removal of Tonearm with Tonearm Bearing
5	Adjustment of the Tonearm Bearing
5	Antiskating Device
6	Tonearm Control
6	Tonearm Lift
6	Removal of Lift Pin
7	Starting
7	Manual Start
7	Short Circuiter
7	Shutt-off and Change Cycle
7	Stopping
8	Record Drop
8	Shut-off Mechanim
8	Adjustment points:
	Tonearm set-down point
8	Set down point for 30 cm records
8	Set down point for 17 cm records
8	Switch off position
8	Pawl
9	Release rocker
9	Release
9	Platter does not
9	Platter does not come up to speed
9	Stylus slips out of record groove
9	Motor does not shut-off
9	Acoustic feed back
10 – 13	Replacement parts with exploded views
14	Lubricating instructions

Technical data

Current	AC 50 or 60 Hz, changeable by changing motor pulley
Line Voltage	110 – 125 V or 220 – 240 V, switchable
Drive	Dual 8-pole synchronous motor: precision flat belt for flywheel drive
Power consumption	approx. 10 watts
Starting Time	(ro reach nominal speed) approx. 2 seconds at 33 1/3 rpm
Power Consumption	at 220 V, 50 Hz: approx. 75 mA at 117 V, 60 Hz: approx. 140 mA
Platter Speeds	Non-magnetic, dynamically balanced, detachable, 1.3 kg, 300 mm ϕ
Platter speeds	33 1/3 and 45 rpm. Automatic tonearm set-down coupled with speed adjustment
Total Wow and Flutter	According to DIN 45 507 (German Industry Standard) $< \pm$ 0.09 %
Rumble	Unweighted $>$ 42 dB (according to DIN 45 507) Weighted $>$ 63 dB
Tonearm	Torsion-resistant tubular aluminum tonearm in four-point gimbal
Effective Length of Tonearm	221 mm
Offset Angle	24° 4'
Tangential Tracking Error	0.16°/cm
Tonearm Bearing Friction (related to stylus tip)	Vertical $<$ 0.08 mN (0.008 g) Horizontal $<$ 0.20 mN (0.020 g)
Stylus Pressure	from 0 - 30 mN (0 - 3 g) infinitely variable, operable from 2.5 mN (0.25 g) stylus pressure up
Cartridge Holder	Removable, accepting any cartridges with 1/2" mounting and a weight from 5.5 to 10 g (including mounting hardware)
Adjustable Overhang	5 mm
Weight	approx. 4.6 kg

For dimensions and cutout refer to installation instructions

Fig. 2

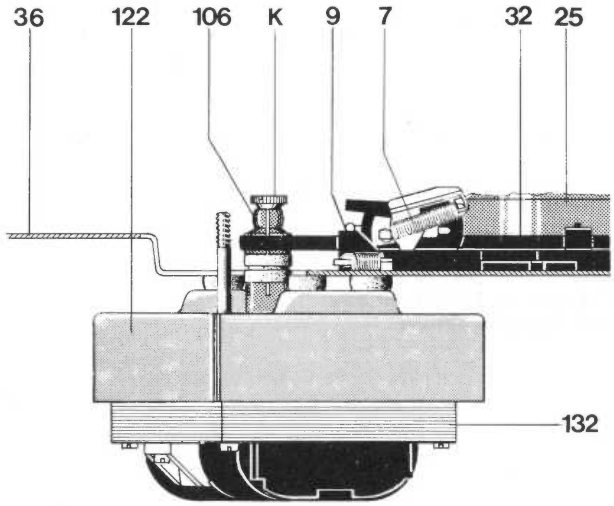


Fig. 3

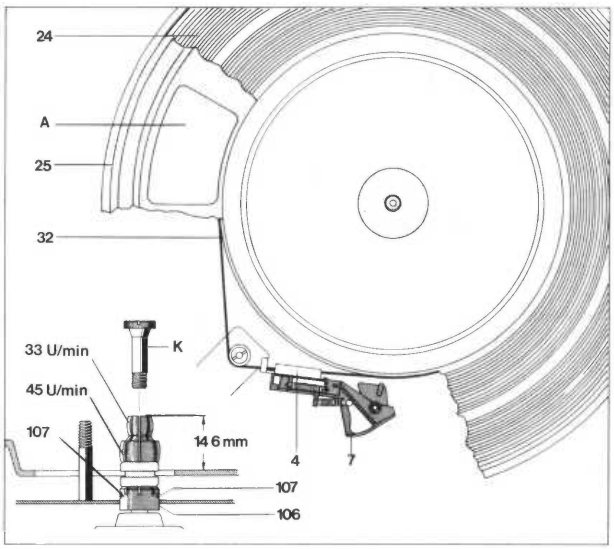
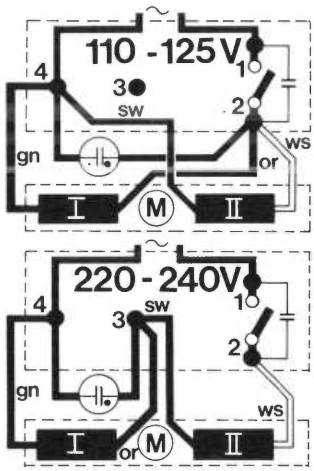


Fig. 4



Motor and Drive

Power for the turntable platter and the changing mechanism is supplied by a split eight pole synchronous motor suspended by radially located elastic mounts and having a very small stray magnetic field as well as little vibration.
The speed of the motor is independent of line voltage, temperature or load variations. Speed is dependent on and proportional to power line frequency. The motor is adapted to 50 or 60 cycle (Hz) power line frequencies by the correct choice of the motor pulley.

Pulley for 50 Hz Art.-No. 240 972
Pulley for 60 Hz Art.-No. 240 973

The drive is transmitted to the platter by means of the flat belt (32).

Speed Changeover

Platter speeds of 33 1/3 and 45 rpm are adjusted by linking the flat belt (32) to the corresponding step of the drive pulley (106) (Fig. 3).
The speed switch lever is brought into the required position (33 or 45 rpm) by means of the speed selection lever (11), the switch lever (101) and the spring lever of the switch levers. If the machine is switched off, then the switch lever is interlocked by the stop lever (8). The speed is only preselected in this way. The stop lever (8) is only released when the platter (25) turns. This then moves the flat belt (32) onto the required step of the drive pulley (106).

Platter

The platter (25) is held in position by the platter locking lever (23). When removing the platter, lift the platter mat over one of the cutouts and rotate the platter until the cutout is above the drive pulley. Detach the flat belt (32) from the drive pulley (106) and lay it on the running surface of the platter.

The sandwich platter (16) is secured by means of a spring clip on the bearing tube of the bearing housing (164). This clip should be taken away when removing the platter.

Flat Belt

The exchanging of the flat belt is described above with the platter to be removed. Fit the new belt to the running surface of the platter (25).

Warning: The ground (matt) side of the belt must be in contact with the running surface of the platter. Reinstall the platter and lay the flat belt back over the drive pulley (106).

Changing the drive pulley

1. Remove the flat belt (32) from the drive pulley (106) and take off the platter (25). Remove the toothed belt (100).
2. Loosen set screws (107) and remove motor pulley (106).
3. Put complete exchange motor pulley on motor shaft. Turn out conical sleeve (K). Adjust height of motor pulley (106) according to Fig. 3. Fix threaded pins (107) uniformly. Turn conical sleeve into motor pulley (106) again.
4. Install platter (25) and put flat belt (32) on motor pulley (106).
5. Check nominal speed with strobe disk. If necessary make adjustments as described below.

Adjusting nominal speed

Lift platter mat (24) over one of the cut-outs (A) and turn platter (25) until the motor pulley (106) becomes visible in the cut-out. Hold motor pulley (106) and turn conical sleeve (K). If the nominal speed is too high, turn conical sleeve anti-clockwise. If the nominal speed is too low, turn conical sleeve (K) clockwise. Make adjustments with strobe disk and repeat adjustments if necessary.

Tonearm and Tonearm Bearing

The Dual 1241 has a feather-light, extremely torsion-resistant all-metal tonearm which is suspended in a gimbal. Suspension is by means of 4 hardened and precision polished steel points which rest in precision ball bearings. Tonearm bearing friction is thus reduced to a minimum.

Bearing friction vertical < 0.08 mN (0.008 p)
Bearing friction horizontal < 0.20 mN (0.020 p)
related to stylus tip.
As a result, it ensures most favourable pick-up conditions. Before adjusting the pick-up force to suit the built-in pick-up cartridge the tonearm is balanced with the scale set to zero. Coarse adjustment is carried out by moving the weight with the pin (65), the subsequent fine adjustment by turning the weight. The balance weight is designed such that pick-up cartridges having a deadweight (incl. hardware) of 5.5 - 10 g can be balanced. The tracking force is adjusted by turning the graduated spring housing (81) incorporating a coil spring. The scale has markings for a range of adjustment from 0 to 30 mN (0 to 3 p) which permit accurate adjustment of the tracking force.

Removing the tonearm from the bearing frame

1. Clamp unit in the repair stand. Remove the counter-weight (65), remove clamp screw (71). Set spring housing scale (81) to zero.
2. Turn the unit over and remove the shield (149). Unsolder the tonearm connections on the muting switch (146).
3. Turn the unit back to normal position.
   Remove the two fixing screws (75) (SW 4.5) and the cable holder (66). Remove the tonearm (58).

Removing the tonearm with tonearm bearing

We recommend the following procedure:

1. Clamp unit in the repair stand. Set spring housing scale (81) to zero. Lock tonearm (63). Remove weight (65).
2. Turn unit over and remove the screening sheet (149). Unsolder the tonearm connections on the muting switch (146).
3. Lift off main lever (177). Remove safety washer (242). Turn positioning screw (42) until rotary bearing (241) and positioning bar are free. Remove safety washer (228) and positioning bar (204).
4. Unlock tension spring (212), loosen safety washer (216) and remove skating lever (215).
5. Remove safety washer (206) and sliding washer (205) and take shut-off bar (179) from segment.
6. Remove hex nuts (202) and segment (200).
7. Hold tonearm (63). Remove hex nut (48) and tonearm cpl. with tonearm bearing.

Reverse this procedure when reassembling.

Replacing spring housing

Remove tonearm (63) from bearing frame (68) as described above. Loosen lock nut (77) and threaded pin (76). Unscrew bearing screw (83). Lift bearing frame (68). Remove spring housing (81) and washer (82). When installing note that the helical spring catches the bearing frame. Slide in washer (82) and tighten bearing screw (83). Reinstall tonearm (63). Set bearing play as described below using threaded pin (76) and lock nut (77).

Fig. 5

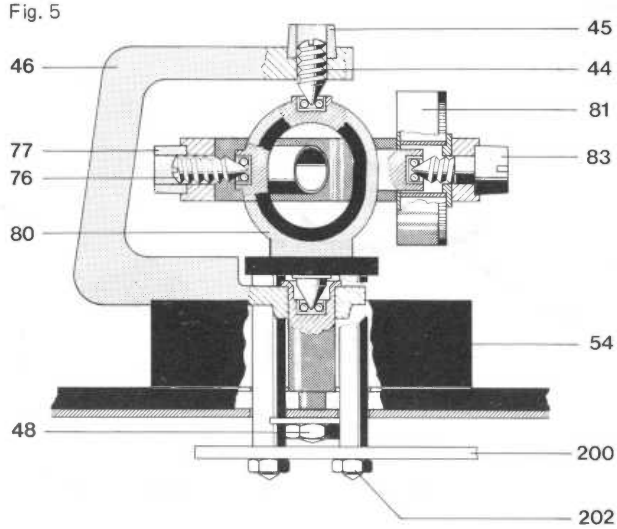
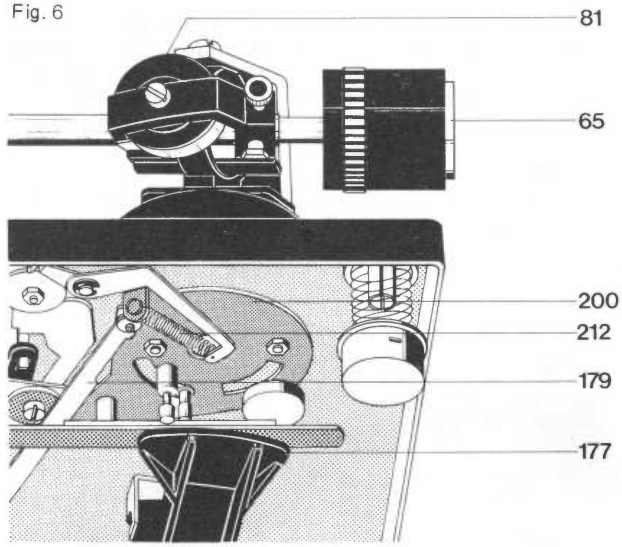


Fig. 6



Adjusting the tonearm bearing

First balance tonearm exactly. Both bearings must have slight, just perceptible play.
The horizontal tonearm bearing is correctly adjusted when at anti-skating settings "0.5" and being touched it slides in without resistance.: The vertical tonearm bearing is correctly adjusted when it swings in after being touched. The play of the horizontal tonearm bearing should be adjusted with threaded pin (76).

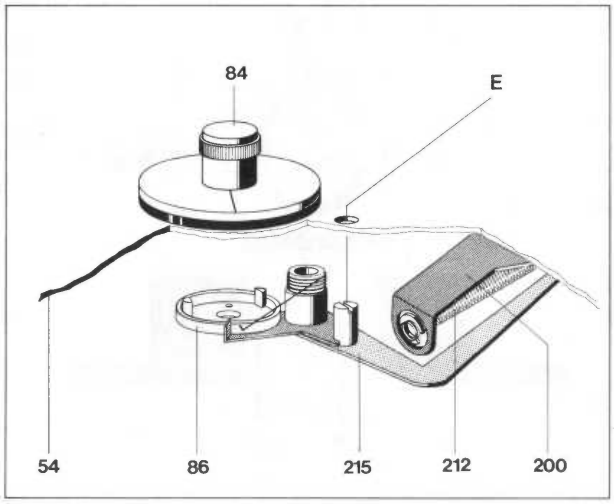
Antiskating Device

The adjustment of the antiskating force is made by turning the indicator disc located on the supporting back (84). The skating lever (215) is displaced from the tonearm fulcrum by an amount depending on the setting of this control. The antiskating force is transmitted to the tonearm (63) via the tension spring (212) and segment (200).

Optimum adjustment is carried out at the works for styli with a tip radius of 15 µm (spherical), 5/6 and 18/22 µm (elliptical), and CD 4-cartridges.

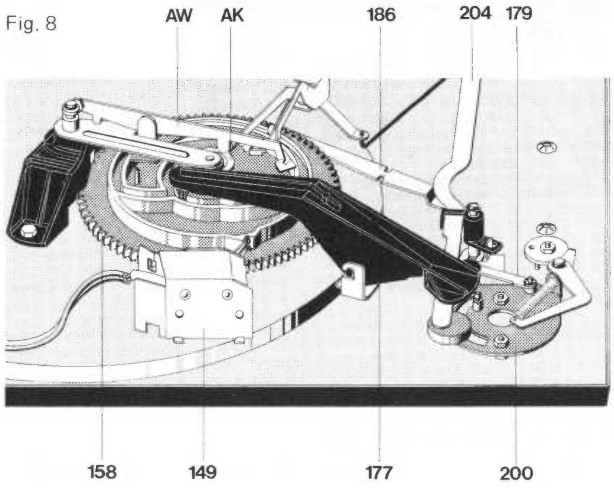
Any alteration can only be carried out with the aid of a Dual-Skate-0-Meter and a test record and should only be done by an authorized service station.

Fig. 7



Balance tonearm (63) correctly. Set pointer disk (84) to 0. The tonearm should remain at any desired point within its turning range. The hole of the skating lever (215) should be in alignment with the center line of the tonearm. Adjustment is made by the eccentric pulley (E) which is accessible through the hole in the installation plate between the pointer disk and the tonearm mounting plate. See Fig. 7.
Then set pointer disk to "0.5". The tonearm should now smoothly return from the platter center to its rest.

Fig. 8



Tonearm Control

Automatic movement of the tonearm is initiated by the control cams on the bottom side of the cam whel (158) on rotating through 360°.
The control elements for raising and lowering are the main lever (177) and lift pin (56), for horizontal movement the main lever (177) with segment (200).

The automatic tonearm set down is designed for 30 cm and 17 cm records and is coupled to the platter speed changeover. The set-down points of the tonearm are determined by the spring pin of segment (200) contacting the setting rail (204). Limitation of the horizontal movement of the tonearm is produced by the pin of segment contacting the stop attached to the setting rail (204). Only during set-down does main lever (177) lift the slide bar (204) and the stop attached to it which, as a result, moves into the swivel range of the stop pin fitted on the segment. After completion of set down (lowering of the tonearm onto the record) the setting rail (204) is released again and returns to neutral position. As a result the stop moves out of the swivel range of the stop pin so that unimpeded horizontal movement of the tonearm is possible for playing.

Tonearm lift

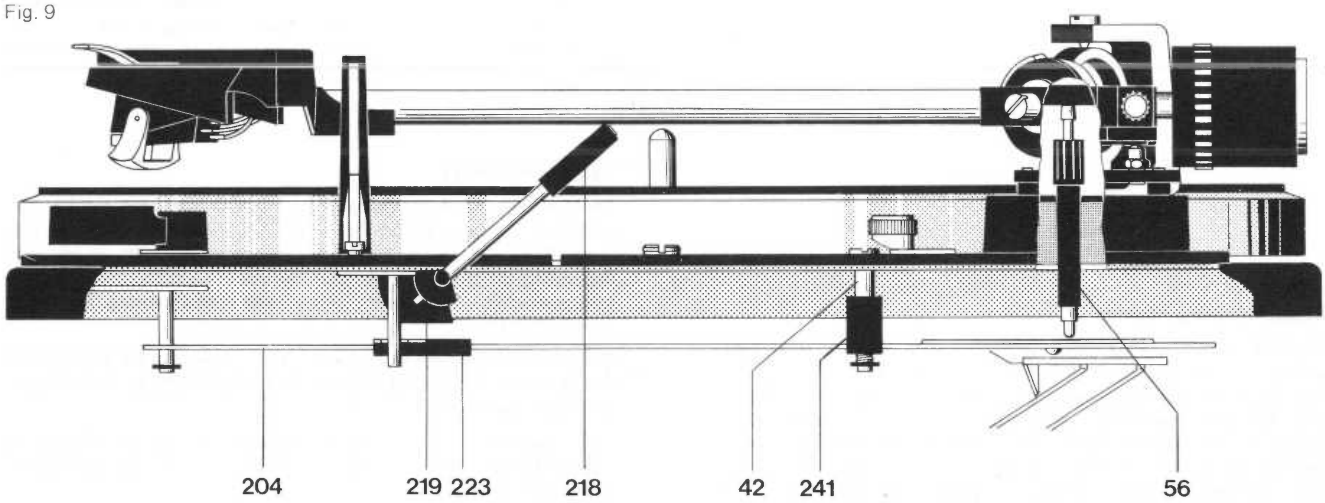
Raising the lever (218) to position " ▼ " or " ▼ " moves the lift cam (219) and the setting rail (204) so that the tonearm is raised from the record (or lowered onto it). If the unit is started with the arm lever in the " ▼ " position, then the tonearm is guided over the record by the set-down mechanism. Only when the lever (218) is brought to the position " ▼ " will the tonearm be lowered onto the record. The vertical lift height can be adjusted by means of the locating screw (42) and should be 3 – 5 mm.

Adjustment of Lifting Bolt

1. Remove tonearm cpl. with tonearm bearing as described on page 5).
2. Remove guide (52) on lifting bolt. Remove lock washer (51), adjusting sleeve (52) and second lock washer (51).
3. Remove lifting bolt (52) and compression spring (55).

Before reassembling clean lifting bolt and lift tube with wacker silicone oil AW 300 000.

Fig. 9



Start

Switching the start/stop lever (58) into the "start" position initiates the following sequence:

a) The start lever (207) rotates the switch lever (193) which is pivoted about the notched stud. At the same time, the switch arm is moved and the motor (132), via the mains switch, and the platter starts turning.

b) This switch lever is coupled to the switch angle (193) and this is brought into the range of the shift lever so that the next rotation of the cam forces this into its starting position.

c) Operating the start/stop lever (58) also releases the start slide (191) which is drawn toward the cam by means of the tension spring (192). This causes the shut-off lever to engage with the drive pinion and the cam turns.

Manual start

The latch (236) which is connected to the switch arm (186) engages in the four-sided plate when the tonearm is moved manually. The switch arm (186) connects the mains supply to the motor via the power switch and the platter rotates.
When the run-out of the record is reached, the tonearm is lifted and the motor is switched off automatically. If the tonearm is lifted off the record before the run-out, and returned by hand to the pillar, then the bolt on the segment (200) engages the latch so that the switch arm is returned to its starting position. This switches off the mains supply.

Short Circuiter

To prevent disturbing noises during automatic operation of the tonearm the unit is fitted with a short circuiter. Control of the switch springs for both channels is effected by the cam wheel. With the unit in neutral starte the short circuit of the pick-up leads is eliminated.

Adjustment point

In zero position of the cam there should be a clearance of approximately 0.5 mm between the contacts of the short ciruiter. This clearance should be adjusted by bending the short circuit contact. The contacts should be sprayed with a suitable cleaning agent.

Shut-off and change cycle

The dog (M) on the turntable platter gear (PR) and the shut-off lever actuate both the change cycle at the end of the record as well as the shut-off after the last record in a stack is played. At the end of a record, the tonearm moves towards the center at an accelerated rate due to the increased pitch of the grooves. This motion carries the shut-off lever towards the dog by means of the stop lever (179). The eccentric dog pushes the shut-off lever back at each revolution as long as the tonearm advance is only one normal record groove (Fig. 12 a).
The run-out groove with its steeper pitch moves the shut-off lever against the dog with greater force, engaging the shut-off lever and causing the main cam wheel (158) to be driven out of its neutral position by the turntable platter gear.

Stopping

When control lever is set to "stop" position the start lever (191) which is pulled towards the cam by means of tension, comes free. As a result, the shut-off lever is moved into the range of dogs cam. The cam follower lever remains in its stop position.

Fig. 10

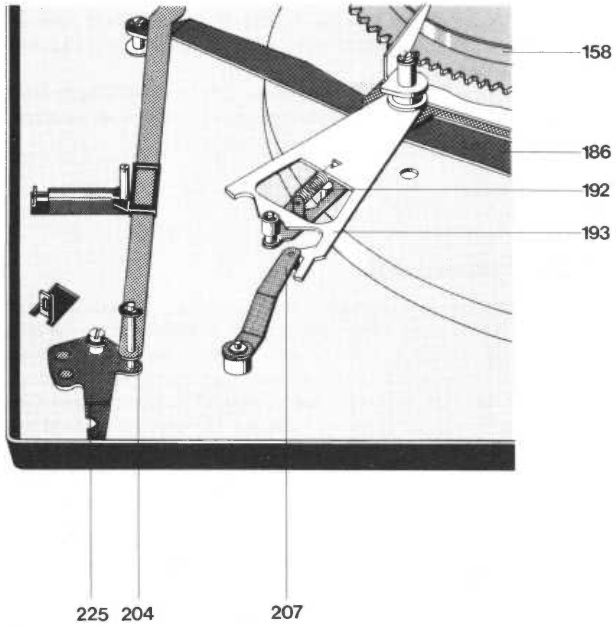


Fig. 11

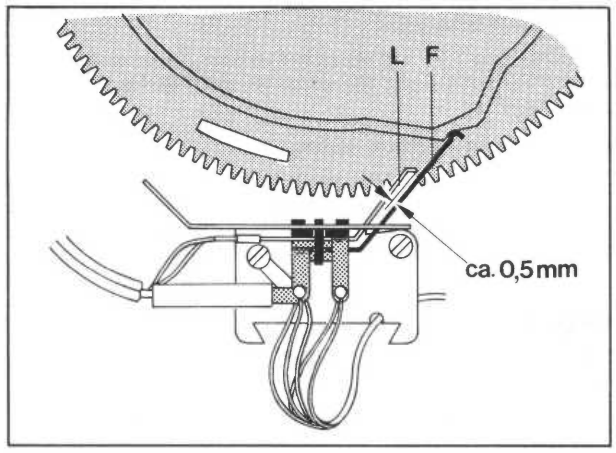
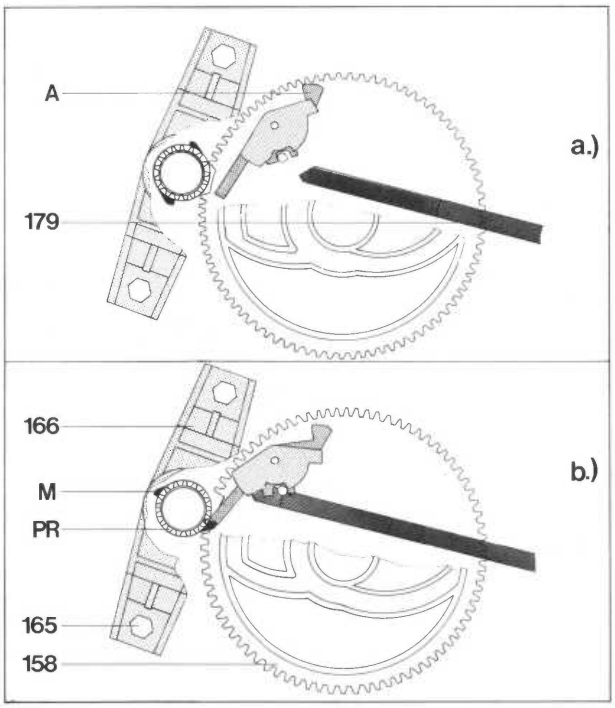


Fig. 12



Record drop

Insert the appropriate spindle – AW 3 for standard records (7 mm or 1/4" center hole) or AS 12 for 45 rpm records (38 mm or 1 1/2" center hole).
The record drop is initiated by the cam wheel (158) whose drop cam surface (AK) controls the release rocker (AW) and the changer actuator rod.

Shut-off mechanism

Shut-off and change functions are determined by the position of the cam follower lever. After every start or record drop, the cam follower lever is brought to its stop position by the main lever (longer end towards the center of the main cam). As the record is dropped the cam follower lever is turned to its start position by the cam rocker, so that the tonearm can swing in toward the record and be lowered on to it. If there are no more records on the spindle, and the cam rocker cannot turn the cam follower lever, the lever remains in its stop position and allows the tonearm to swing to its rest position.
When the main cam wheel (158) returns to its neutral position, the switch arm drops into a cut-out in the main cam, opening the power switch (135) and disengaging the drive idler.

Tonearm set down point

Lift Dual logo (88) sligthly in left bottom corner and turn outside. There is one of the adjustment screws (Fig. 19) in the opening now visible.

Set-down point for 30 cm records

Set adjustment knob (11) to "45" and adjust setting with a suitable screwdriver. If the stylus sets down too far inside, turn adjustment screw clockwise, if the stylus sets down outside the 30 cm record turn adjustment screw anti-clockwise.

Set-down point for 17 cm records

Set adjustment knob (11) to "33" and proceed by turning the screw as described above.

The switch off position

With the tonearm on the pillar, the eccentric (B) can be adjusted to alter the switch-off position.

Fig. 13

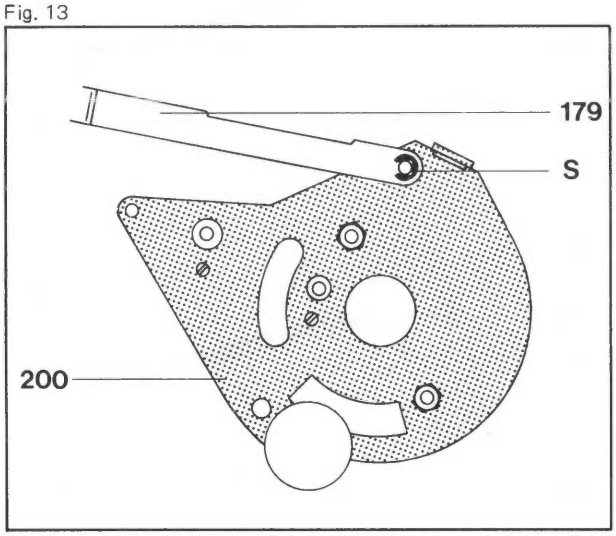


Fig. 14

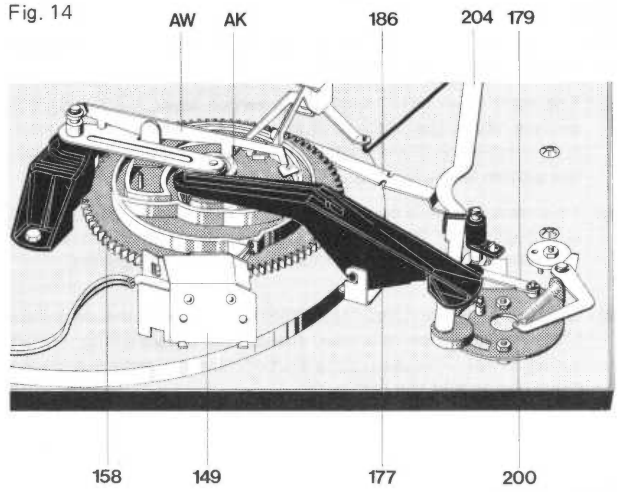
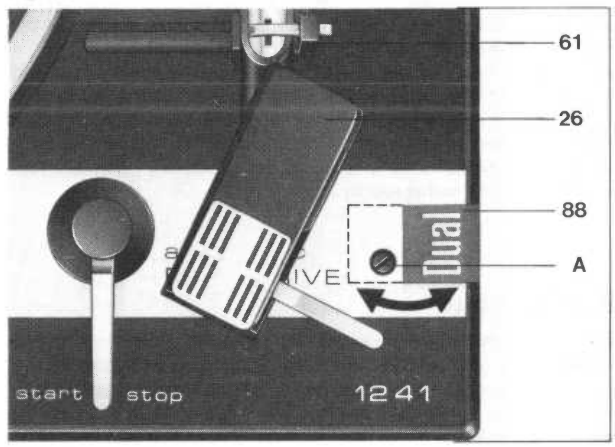


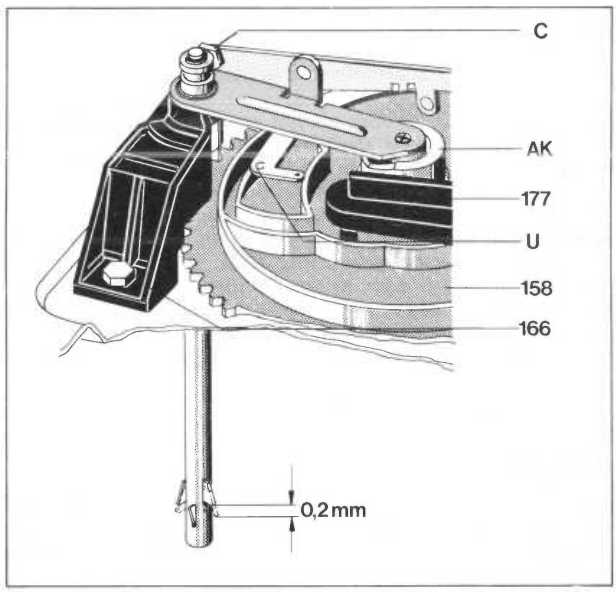
Fig. 15



Release rocker

The eccentric screw (c) is used to alter the travel of the changing bolt (168). The setting is correct when at the rest position of the cam wheel (158), and with interlocked changer spindle, the changing bolt (168) has a travel of 0.2 mm.

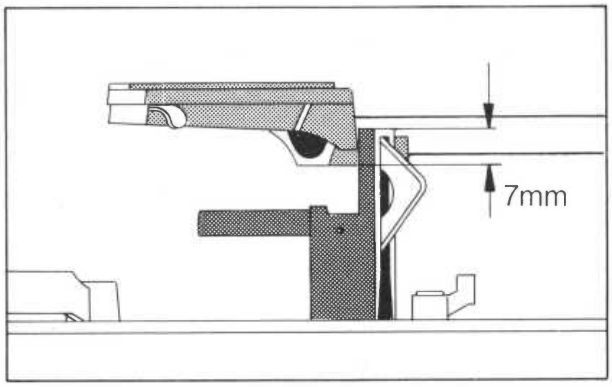
Fig. 16



Tonearm vertical lift

The adjustable sleeve (52) is used to adjust the tonearm vertical lift (for automatic operation). Pull out the mains plug, unlock the tonearm, turn the cam wheel (158) until the tonearm reaches its highest point of travel. The tonearm should now be approximately 7 mm above the pillar stop (see Fig. 17). Adjust by means of sleeve (52).

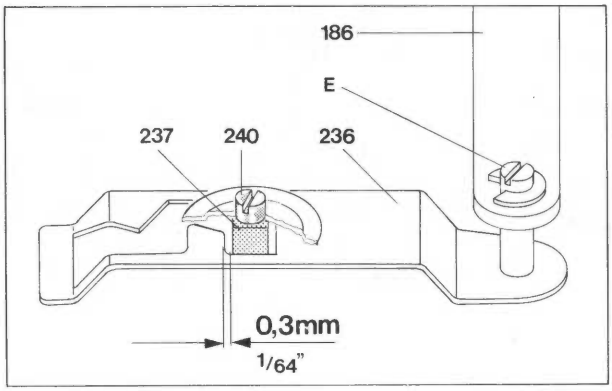
Fig. 17



Pawl

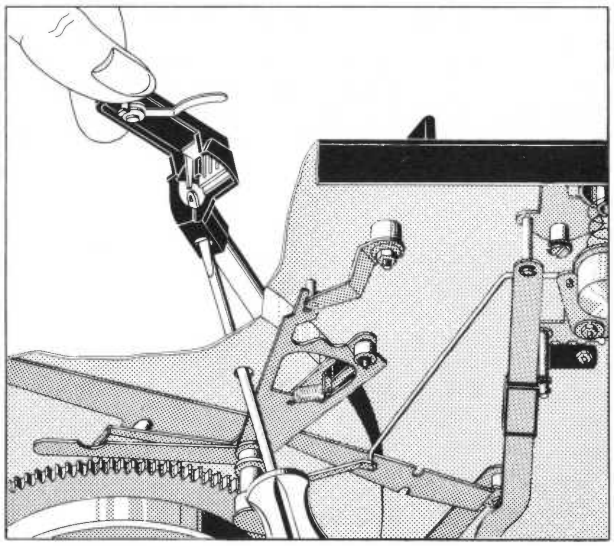
The play of the pawl (236) may be adjusted with the eccentric screw (E).
Pull out mains plug and turn unit over. Turn tonearm in until pawl is caught. Turn cam wheel (158) out of "zero" position.
There should be about 0.3 mm play between pawl (236) and square section. If necessary turn eccentric screw (E) to left or right.

Fig. 18



Defect	Cause	Remedy
Platter does not turn after switching unit on and moving tonearm inside	a) Belt not mounted	a) Mount belt
	b) Power supply to motor interrupted	b) Check connections at switch plate and power play
	c) Motor pulley is loose	c) Fix Motor pulley
Platter does not come up to its required speed.	a) Drive pulley is not correct for local line frequency	a) Renew drive pulley
	b) Slippage between flat belt and drive pulley or between flat belt and flywheel rotor	b) Clean friction surfaces of flat belt, drive pulley and flywheel rotor. Renew flat belt if necessary. Once the flywheel rotor has been cleaned do not touch it with your fingers.
	c) Excessive friction in motor bearing or flywheel rotor bearing assembly	c) Clean and oil bearings.
Stylus slides out of playing groove	a) Tonearm is not balanced	a) Balance tonearm
	b) Tonearm tracking force is too low	b) Adjust tracking force to the value stated by the cartridge manufacturer
	c) Anti-skating setting incorrect	c) Correct anti-skating setting
	d) Stylus tip worn or chipped	d) Renew stylus
	e) Excessive bearing friction in tonearm bearing	e) Check tonearm bearings and readjust if necessary
	f) Steel ball (178) of shut-off bar missing	f) Renew steel ball
Motor does not switch off when tonearm sets down on rest.	Capacitor type suppressor (in power switch) defective (short circuit).	Replace capacitor type suppressor in power switch.
Acoustic feedback	a) Chassis components (e. g. connecting leads) rubbing on board cut out.	a) Line up mounting board cut-out according to installation instructions.
	b) Connecting leads too tight.	b) Slacken or lengthen leads.

Fig. 19



Defect

Tonearm head not parallel to platter.

Cause

Seat of tonearm head on the tonearm tube has changed during transit.

Remedy

Remove platter. Insert screwdriver through the hole in the chassis mounting plate. Align tonearm head and retighten screw.

Replacement parts

Pos.	Part. No.	Qty.	Description	
1	215 470	1	Automatic spindle AS 12	
2	213 895	1	Automatic spindle AW 3	
3	220 213	1	Centering piece	
4	201 101	1	Centering pin	
5	234 428	1	Support compl.	
6	210 472	8	Machine screw	AW 3 x 4
7	232 086	1	Tension spring	
8	234 430	1	Stop lever	
9	241 414	1	Tension spring	
10	210 194	1	Grip ring	2 x 0.6
11	237 976	1	Rotary knob	
14	240 960	1	Speed selector cover	
15	213 260	3	Nail	
16	239 414	3	Shipping screw compl.	
17	210 146	3	Lock washer	3.2
18	201 632	3	Rubber washer	
19	237 117	3	Washer	
20	237 118	3	Lock washer	
21	237 668	3	Special screw	
22	238 434	1	Washer	
23	200 543	1	Lock washer	
24	242 092	1	Platter mat compl.	
25	242 093	1	Platter with mat compl.	
26	237 224	1	Tonearm head compl.	
27	237 223	1	Contact plate compl.	
28	234 611	1	Handler	
29	210 182	1	Lock washer	
30	210 630	1	Washer	4.2/8/0.5
31	210 197	1	Grip ring	
32	234 435	1	Flat belt	
33	236 242	1	Holder	TK 24
34	210 472	8	Machine screw	AM 3 x 4
35	234 599		Return later	
36	242 094	1	Mounting plate compl.	
37	237 226	1	Spring suspension compl. (Tonearm side front)	
37	237 227	2	Spring suspension compl. (Tonearm side)	
37	237 228	1	Spring suspension compl. (Tonearm side back)	

Pos.	Part. No.	Qty.	Description	
38	230 529	4	Threaded part	
39	236 710	1	Compression spring (Tonearm side front)	
39	236 711	2	Compression spring (Motor side)	
39	236 712	1	Compression spring (Tonearm side back)	
40	200 723	4	Rubber damping	
41	200 722	4	Steel cup	
42	240 069	1	Adjustment screw	
44	230 063	1	Threaded pin	
45	234 635	2	Lock nut	
46	240 962	1	Frame compl.	
47	210 643	1	Washer	4.2/12/1
48	210 366	1	Hex nut	M 4
49	237 738	1	Fillister sunk screw	M 3 x 8
50	237 660	1	Guide	
51	210 143	2	Lock washer	1.5
52	218 318	1	Locating	
53	241 930	2	Fillister sunk screw	M 3 x 5
54	242 096	1	Cover back compl.	
55	216 853	1	Compression spring	
56	240 054	1	Lift pin compl.	
57	200 444	2	Lock washer	
58	240 062	1	Switch lever right compl.	
59	242 097	1	Cover front compl.	
60	200 444	4	Spring washer	
61	236 911	1	Support compl.	
62	210 362	1	Hex nut	M 3
63	237 232	1	Tonearm compl.	
64	210 147	1	Lock washer	
65	240 964	1	Weight compl.	
66	238 666	1	Pin	
67	233 744	1	Brachet	
68	242 098	1	Bearing frome compl.	
69	236 160	2	Support sheet	
70	239 565	2	Machine screw	M 2.5 x 3
71	241 447	1	Clamp screw	
72	238 623	1	Pointer	
73	238 201	1	Threaded plate	

Replacement parts

Pos.	Part. No.	Qty.	Description	
74	237 672	1	Nail	
75	238 202	2	Screw	
76	234 634	1	Threaded pin	
77	234 635	2	Stop nut	
78	242 131	1	Adjustment screw	
80	242 099	1	Frame compl.	
81	236 907	1	Spring housing	
82	237 563	1	Washer	
83	237 564	1	Bearing screw	
84	239 582	1	Pointer washer	
85	216 867	1	Lock washer	5.2/10
86	225 176	1	Cam washer	
87	210 362	1	Hex nut	M 3
88	234 533	1	Dual plate	
89	222 279	1	Washer	4.2/10/0.3
90	218 894	1	Lock washer	3.2/8
91	210 196	1	Ring	
93	210 586	1	Washer	3.2/7/0.5
100	210 146	1	Lock washer	3.2
101	232 096	1	Switch lever	
102	236 374	1	Bracket spring	
103	240 491	1	Conection part	
104	210 586	1	Washer	3.2/7/0.5
105	210 362	1	Hex nut	M 3
106	240 972	1	Drive pulley 50 Hz compl.	
106	240 973	1	Drive pulley 60 Hz compl.	
107	233 137	2	Threaded pin	M 2.5 x 3
119	210 366	3	Hex nut	M 4
120	210 480	1	Machine screw	AM 3 x 6
121	210 609	1	Washer	3.2/10/1
122	241 328	1	Screening shut compl.	
123	232 841	3	Rubber damping	
124	232 840	1	Plate	
125	241 570	1	Top bearing bracket compl.	
126	209 939	1	Sleeve	
127	241 569	1	Stator	110/220 V
128	233 815	1	Machine screw	AM 2,5 x 18
129	241 571	1	Armature compl.	
130	241 572	1	Bottom Bearing brachet compl.	
131	210 525	2	Machine screw	AM 4 x 25
132	242 076	1	Motor SM 860-1 compl.	
133	234 592	1	Lever	
134	242 094	1	Mounting plate compl.	
135	242 581	1	Power switch (direct connection with out strob)	
135	242 582	1	Power switch compl.	
136	236 335	1	Slider	
137	200 444	1	Lock washer	
138	233 012	1	Switch plate compl. (10 nF)	
138	236 605	1	Switch plate compl. (68 nF)	
139	230 148	1	Switch lever	
140	239 732	1	Tension spring	
141	219 200	1	Snap spring	
142	241 883	1	Capacitor 10 nF/250 V	
	230 335	1	Capacitor 68 nF/250 V/20 %	
143	242 095	1	Cover	
144	210 498	1	Machine screw	M 3 x 28
145	231 079	1	Cable holder compl.	
146	232 987	1	Short circuiter compl.	
147	239 562	1	Soldering lug	
148	210 472	1	Machine screw	AM 3 x 4
149	232 084	1	Scruning shut	
158	236 912	1	Curve red compl.	
160	200 522	1	Snap spring	
163	210 366	1	Hex nut	M 4
164	229 754	1	Ball bearing	
165	218 155	2	Hex screw	M 4 x 6
166	242 100	1	Bearing bridge compl.	
167	234 576	1	V-spring	
168	234 577	1	Changing bold	
169	213 920	1	Compression spring	
170	213 921	1	Sluve	
171	210 145	1	Lock washer	2.3
172	210 587	1	Washer	3.2/7/1
173	234 677	1	Bearing support	
174	210 667	1	Washer	5.3/10/0.5

Pos.	Part. No.	Qty.	Description	
175	234 676	1	Screw bolt	
176	210 147	1	Lock washer	4
177	236 914	1	Lever compl.	
178	211 718	1	Ball	ϕ 3
179	234 668	1	Stop lever	
180	234 558	1	Ball bearing	
181	210 472	8	Machine screw	AM 3 x 4
182	210 362	1	Hex nut	M 3
183	240 174	1	Bolt	
184	210 586	1	Washer	3.2/7/0.5
185	236 950	1	Stop sleeve	
186	234 542	1	Switch lever	
187	229 686	1	Tension spring	
188	210 144	1	Lock washer	1.9
189	234 579	1	Stop lever	
190	210 145	1	Lock washer	2.3
191	234 545	1	Start lever	
192	229 698	1	Tension spring	
193	234 550	1	Gear shifting gate	
194	210 146	3	Lock washer	3.2
200	242 101	1	Segment compl.	
201	234 026	2	Threaded pin	M 2.5 x 4
202	210 362	2	Hex nut	M 3
203	223 777	1	Guide	
204	240 060	1	Lever	
205	201 187	1	Washer	
206	210 145	1	Lock washer	2.3
207	234 583	1	Switch lever	
208	210 641	1	Washer	4.2/10/1
209	210 362	1	Hex nut	M 3
210	234 548	1	Roll	
211	210 143	1	Lock washer	1.5
212	218 591	1	Tension spring	
213	201 184	1	Washer	
214	229 688	1	V-spring	
215	240 086	1	Scating lever compl.	
216	210 146	3	Lock washer	3.2
217	237 543	1	Rubber sleeve	
218	237 541	1	Lever compl.	
219	240 063	1	Lift part	
220	210 353	1	Hex nut	M 2
221	240 066	1	Bearing plate	
222	210 469	1	Machine screw	AM 3 x 3
223	234 674	1	Stop part	
224	210 587	1	Washer	3.2/7/1
225	234 588	1	Lever	
226	230 087	1	Screw bolt	
227	210 146	1	Lock washer	3.2
228	210 145	1	Lock washer	2.3
233	239 810	1	Fuse spring	
234	240 070	1	Intermediate plate	
235	210 469	1	Machine screw	AM 3 x 3
236	232 599	1	Pawl compl.	
237	240 071	1	Square part	
238	210 146	6	Lock washer	3.2
239	229 704	1	Washer	3.2/13/0.5
240	210 472	2	Machine screw	AM 3 x 4
241	229 362	1	Guide bearing	
242	210 145	1	Lock washer	2.3
249	209 436	3	Flat plug shell	
250	209 424	1	Five pole plug	
251	207 303	1	Pick-up-lead compl.	
252	207 301	1	Pick-up-lead compl. with cynch plug	
253	209 425	1	Cynch plug white	
254	209 426	1	Cynch plug block	
255	214 602	1	AMP-connector	
256	232 996	1	Power cable europe compl.	
257	232 995	1	Power cable US compl.	
***	214 120	1	Distance roll and screws for TA-mounting	
***	241 320	1	Operating instruction 1241	
***	241 653	1	Operating instruction UAP	
***	241 321	1	Mounting instruction	
***	240 971	1	Shipping carton	
***	241 177	1	Shipping carton CS	

*** not illustraded

Alteration reserved!

Fig. 20 Exploded view 2

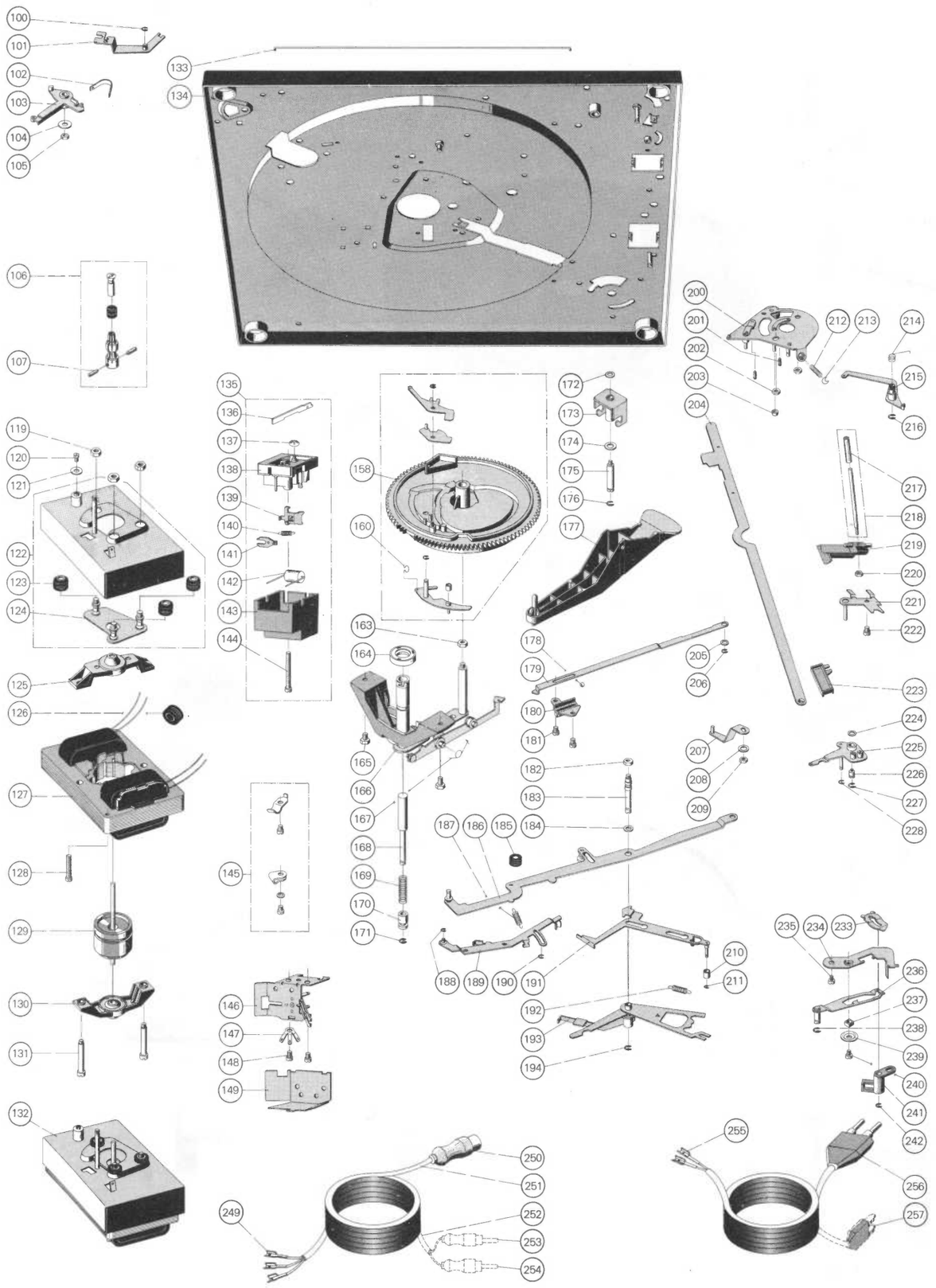
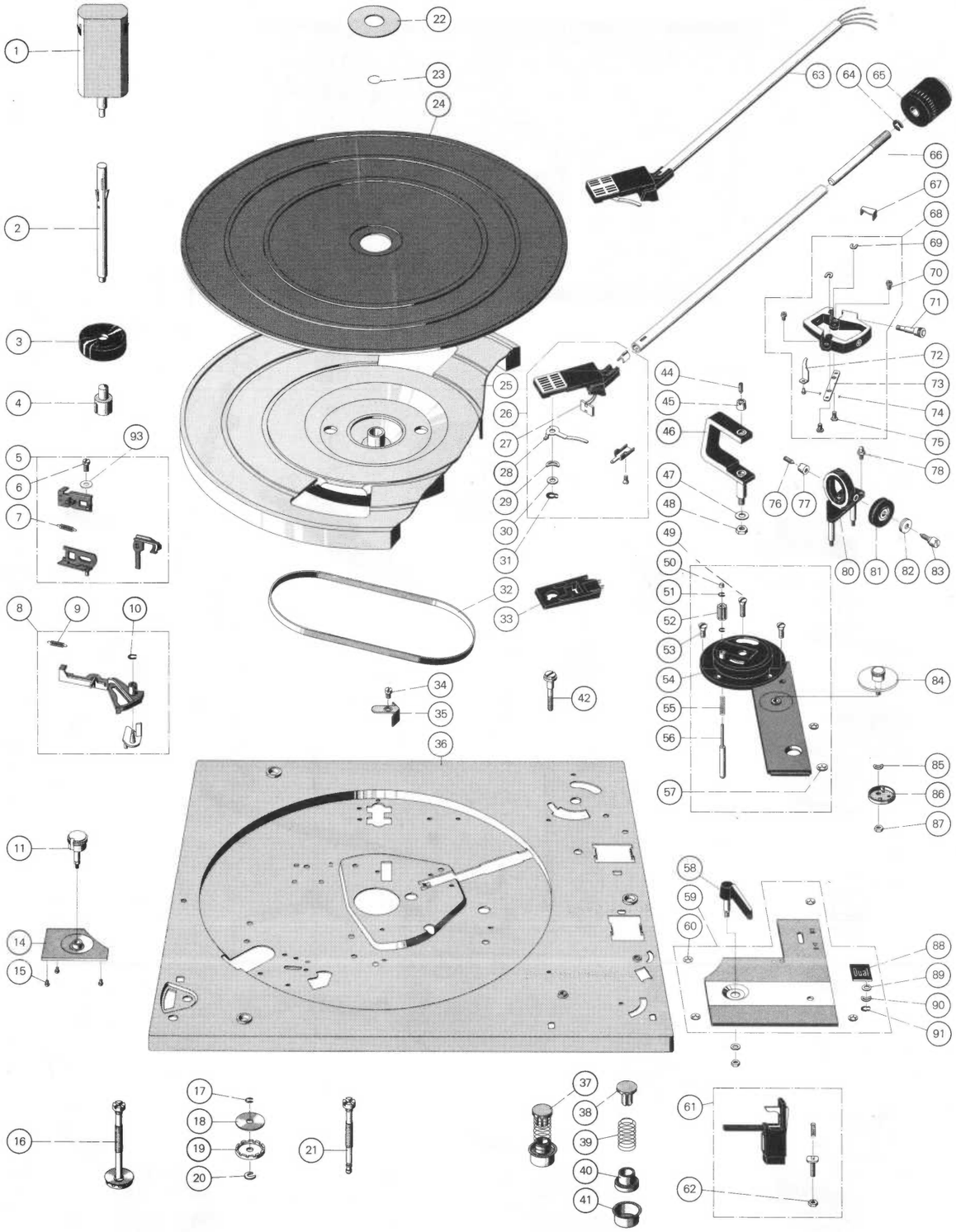


Fig. 21 Exploded view 1



Lubrication

Al bearing and friction points of the unit are adequately lubricated at the works. Replenishment of oil and grease is only necessary after approximately 2 years of normal use of the record player as the most important bearing points (motor bearings) have sintered metal bushes.
Bearing points and friction faces should be lubricated sparingly rather than generously.
It is important that no oil grease should come in contact with the friction faces of the flat belt, drive pulley and flywheel rotor, otherwise slip will occur.
When using different lubricants, chemical decomposition can often take place. To prevent lubrication failure we recommend using the original lubricants stated below.

Fig. 22

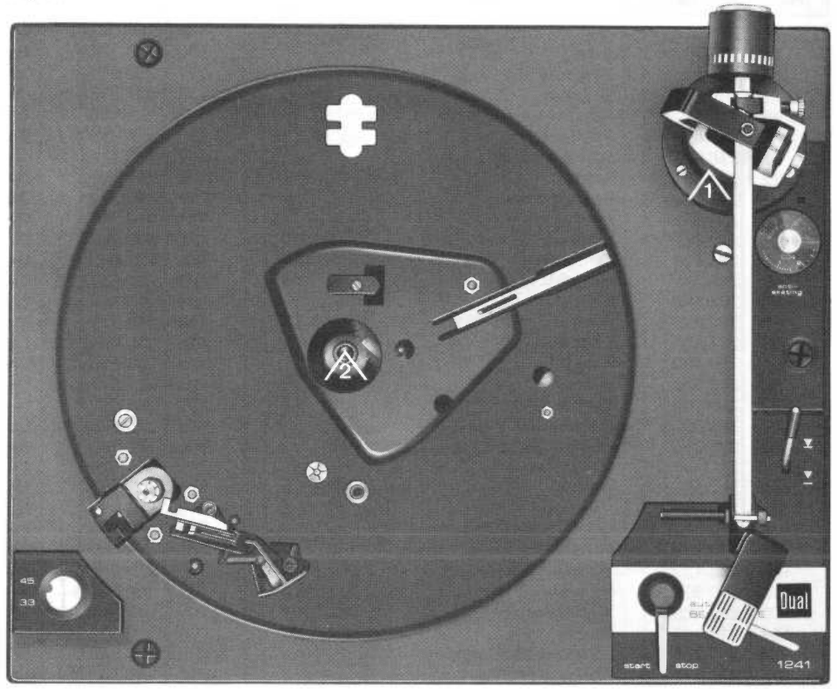
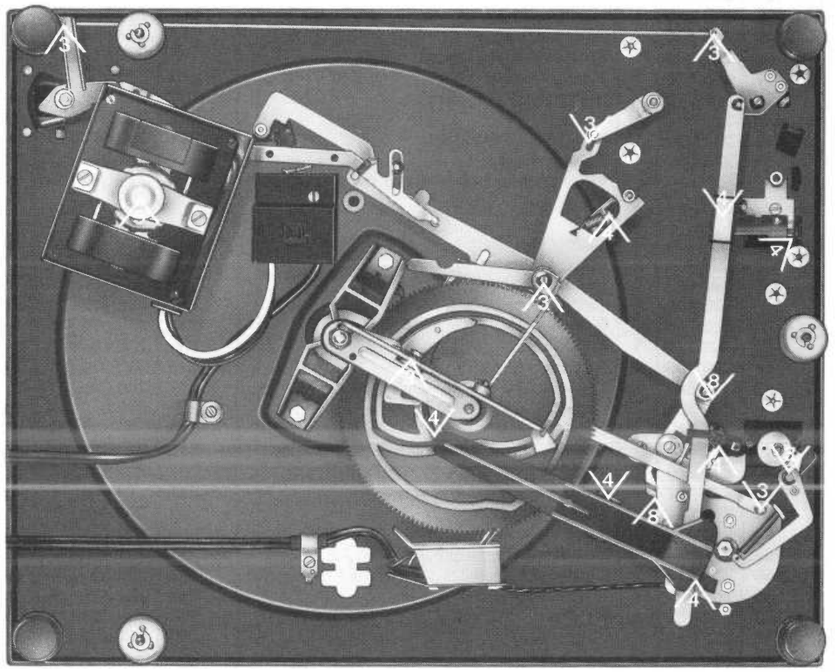


Fig. 23



1 Wacker Siliconeoil AK 300 000

2 Renotac adhesive oil No. 343

3 BP Super Viscostatic 10 W/40

4 Shell Alvania No. 2

5 Isoflex PDP 40

8 Molykote

Dual Gebrüder Steidinger · 7742 St. Georgen/Schwarzwald

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